

**WHAT IS CLAIMED IS:**

1. A pharmaceutical composition containing a therapeutically effective amount of hormone receptor molecule, wherein said hormone receptor molecule is selected from the group consisting of the LH/CG receptor, the FSH receptor, and the TSH receptor.
2. The pharmaceutical composition of claim 1 wherein said hormone receptor molecule contains an extracellular domain of said receptor molecule.
3. The pharmaceutical composition of claim 1 wherein said composition contains a therapeutically effective amount of the LH/CG hormone receptor molecule.
4. The pharmaceutical composition of claim 2 wherein said LH/CG hormone receptor molecule contains at least one sequence selected from the group consisting of:
  - (a) Glu-Leu-Ser-Gly-Ser-Arg-Cys-Pro-Gln-Pro;
  - (b) Pro-Arg-Ala-Gly-Leu-Ala-Arg-Leu-Ser-Leu;
  - (c) Leu-Asn-Glu-Val-Val-Lys-Ile-Glu-Ile-Ser;
  - (d) Ser-Glu-Leu-Leu-Ile-Gln-Asn-Thr-Lys-Asn;
  - (e) Met-Asn-Asn-Glu-Ser-Val-thr-Leu-Lys-Leu;
  - (f) Thr-Leu-Thr-Tyr-Pro-Ser-His-Cys-Cys-Ala;
  - (g) Val-Leu-Ile-Trp-Leu-Ile-Asn-Ile-Leu-Ala;
  - (h) Val-Phe-Ala-Ser-Glu-Leu-Ser-Val-Tyr-Thr;
  - (i) Ala-Ile-Leu-Ile-Phe-Thr-Asp-Phe-Thr-Cys;
  - (j) Phe-Thr-Lys-Ala-Phe-Gln-Arg-Asp-Phe-Leu; and
  - (k) Arg-Ala-Glu-Leu-Tyr-Arg-Arg-Lys-Glu-Phe.
5. The pharmaceutical composition of claim 1 wherein said composition contains a therapeutically effective amount of the FSH hormone receptor molecule.
6. The pharmaceutical composition of claim 1 wherein said composition contains a therapeutically effective amount of the TSH hormone receptor molecule.
7. A recombinant DNA molecule having a gene sequence encoding a hormone receptor molecule, wherein said hormone receptor molecule is selected from the group consisting of the LH/CG receptor, the FSH receptor, and the TSH receptor.
8. The recombinant molecule of claim 7 wherein said molecule is a replicatable vector.
9. The vector of claim 8 wherein the nucleic acid molecule is DNA free of introns.

10. The vector of claim 8 wherein said nucleic acid molecule is capable of hybridizing at 42°C in 20% formamide with the DNA sequence encoding the LH/CG receptor shown in Figure 1.
- 5 11. The vector of claim 8 wherein said nucleic acid molecule is capable of hybridizing at 42°C in 20% formamide with a DNA sequence of at least 10 bases encoding a portion of the complete LH/CG receptor shown in Figure 1.
12. A host cell containing the vector of claim 10.
- 10 13. A host cell containing the vector of claim 11.
14. The host cell of claim 12 that is a eukaryotic cell.
- 15 15. The host cell of claim 12 that is a bacterial cell.
16. The recombinant molecule of claim 8 wherein said molecule expresses either said hormone receptor molecule when present in a host cell.
- 20 17. The recombinant molecule of claim 16 wherein said host cell is a eukaryotic cell.
18. The recombinant molecule of claim 17 wherein said eukaryotic cell is a yeast or a mammalian cell.
- 25 19. The recombinant molecule of claim 16 wherein said host cell is a prokaryotic cell.
20. The recombinant molecule of claim 19 wherein said prokaryotic cell is an E. coli cell.
21. The recombinant molecule of claim 7 wherein said gene sequence encodes the LH/CG hormone receptor molecule.
- 30 22. The recombinant molecule of claim 21 wherein said LH/CG hormone receptor molecule contains at least one sequence selected from the group consisting of:
  - (a) Glu-Leu-Ser-Gly-Ser-Arg-Cys-Pro-Gln-Pro;
  - (b) Pro-Arg-Ala-Gly-Leu-Ala-Arg-Leu-Ser-Leu;
  - (c) Leu-Asn-Glu-Val-Val-Lys-Ile-Glu-Ile-Ser;
  - (d) Ser-Glu-Leu-Leu-Ile-Gln-Asn-Thr-Lys-Asn;
  - (e) Met-Asn-Asn-Glu-Ser-Val-thr-Leu-Lys-Leu;
  - (f) Thr-Leu-Thr-Tyr-Pro-Ser-His-Cys-Cys-Ala;
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- (g) Val-Leu-Ile-Trp-Leu-Ile-Asn-Ile-Leu-Ala;
- (h) Val-Phe-Ala-Ser-Glu-Leu-Ser-Val-Tyr-Thr;
- (i) Ala-Ile-Leu-Ile-Phe-Thr-Asp-Phe-Thr-Cys;
- (j) Phe-Thr-Lys-Ala-Phe-Gln-Arg-Asp-Phe-Leu; and
- 5 (k) Arg-Ala-Glu-Leu-Tyr-Arg-Arg-Lys-Glu-Phe.

23. The recombinant molecule of claim 7 wherein said gene sequence is capable of hybridizing at 42°C in 20% formamide with the DNA sequence encoding the LH/CG receptor shown in Figure 1.

- 10 24. The recombinant molecule of claim 23 wherein said molecule contains at least 10 nucleotides.

25. The recombinant molecule of claim 24 wherein said molecule contains at least 20 nucleotides.

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26. The recombinant molecule of claim 7 wherein said gene sequence is capable of hybridizing at 42°C in 20% formamide with a DNA sequence of at least 10 bases encoding a portion of the complete LH/CG receptor shown in Figure 1.

- 20 27. The recombinant molecule of claim 9 wherein said molecule contains at least 10 nucleotides selected from the group consisting of:

- (a) Glu-Leu-Ser-Gly-Ser-Arg-Cys-Pro-Gln-Pro;
- (b) Pro-Arg-Ala-Gly-Leu-Ala-Arg-Leu-Ser-Leu;
- (c) Leu-Asn-Glu-Val-Val-Lys-Ile-Glu-Ile-Ser;
- 25 (d) Ser-Glu-Leu-Leu-Ile-Gln-Asn-Thr-Lys-Asn;
- (e) Met-Asn-Asn-Glu-Ser-Val-thr-Leu-Lys-Leu;
- (f) Thr-Leu-Thr-Tyr-Pro-Ser-His-Cys-Cys-Ala;
- (g) Val-Leu-Ile-Trp-Leu-Ile-Asn-Ile-Leu-Ala;
- (h) Val-Phe-Ala-Ser-Glu-Leu-Ser-Val-Tyr-Thr;
- 30 (i) Ala-Ile-Leu-Ile-Phe-Thr-Asp-Phe-Thr-Cys;
- (j) Phe-Thr-Lys-Ala-Phe-Gln-Arg-Asp-Phe-Leu; and
- (k) Arg-Ala-Glu-Leu-Tyr-Arg-Arg-Lys-Glu-Phe.

28. The recombinant molecule of claim 7 wherein said gene sequence encodes the FSH  
35 hormone receptor molecule.

29. The recombinant molecule of claim 7 wherein said gene sequence encodes the TSH hormone receptor molecule.

30. A method of treating a condition in an animal or a human which comprises administering to said human a therapeutically effective amount of a pharmaceutical composition containing a therapeutically effective amount of a hormone receptor molecule, wherein said hormone receptor molecule is selected from the group consisting of the LH/CG receptor, the FSH receptor, and the TSH receptor.

31. The method of claim 30 wherein said composition contains a physiologically effective amount of the LH/CG hormone receptor molecule.

32. The method of claim 31 wherein said condition is selected from the group consisting of: fertility, breast cancer, prostate cancer, benign prostatic hypertrophy, vasomotor instability, osteoporosis and polycystic ovarian disease.

33. The method of claim 30 wherein said composition contains a physiologically effective amount of the FSH hormone receptor molecule.

34. The method of claim 33 wherein said condition is selected from the group consisting of: fertility, breast cancer, prostate cancer, vasomotor instability, osteoporosis and polycystic ovarian disease.

35. The method of claim 30 wherein said composition contains a physiologically effective amount of the TSH hormone receptor molecule.

36. The method of claim 35 wherein said condition is Graves Disease, benign prostatic hypertrophy, hypothyroidism or thyroid cancer.

37. A method of detecting a hormone in a sample suspected of containing said hormone which comprises:

(a) incubating said sample in the presence of a receptor for said hormone, under conditions sufficient to permit said receptor to bind to, and undergo detectable change by, any of said hormone present in said sample; and

(b) detecting said hormone by determining whether any of said receptor has become bound to, and undergone detectable change by a hormone molecule; wherein said hormone is selected from the group consisting of: luteinizing hormone, choriogonadotropin, follicle stimulating hormone, and thyroid stimulating hormone.

38. The method of claim 37 wherein said hormone is CG and wherein said hormone receptor is LH/CG receptor.

39. The method of claim 37 wherein said hormone is LH and wherein said hormone receptor is LH/CG receptor.
40. The method of claim 37 wherein said hormone is FSH and wherein said hormone receptor is FSH receptor.
41. The method of claim 37 wherein said hormone is TSH and wherein said hormone receptor is TSH receptor.
42. A method for producing a hormone receptor which comprises:
- (a) constructing a vector that includes a gene sequence which encodes said hormone receptor;
  - (b) transforming a host cell with said vector;
  - (c) culturing said transformed cell in a culture medium under conditions sufficient for said cell to express said gene sequence; and
  - (d) recovering said expressed hormone receptor; wherein said hormone receptor is selected from the group consisting of the LH/CG receptor, the FSH receptor, and the TSH receptor.
43. The method of claim 42 wherein said expressed hormone receptor is secreted into said culture medium by said transformed cell, and wherein said expressed hormone receptor is recovered from said culture medium.
44. The method of claim 42 wherein said hormone receptor is LH/CG receptor.
45. The method of claim 42 wherein said hormone receptor is FSH receptor.
46. The method of claim 42 wherein said hormone receptor is TSH receptor.
47. The method of claim 42 wherein said transformed cell is a eukaryotic cell.
48. The method of claim 42 wherein said transformed cell is a procaryotic cell.
49. An antibody or antigen-binding fragment thereof, substantially free of natural contaminants, which is capable of binding to a hormone receptor selected from the group consisting of the LH/CG receptor, the FSH receptor, and the TSH receptor.
50. The antibody or antigen-binding fragment thereof of claim 49 which is an agonist of an activity of a hormone selected from the group consisting of LH, CG, FSH and TSH.

51. The antibody or antigen-binding fragment thereof of claim 49 which is an antagonist of an activity of a hormone selected from the group consisting of LH, CG, FSH and TSH.
- 5 52. The recombinant molecule of claim 28 wherein said molecule comprises a replicatable vector.
53. The vector of claim 52 wherein said molecule is DNA free of introns.
- 10 54. The vector of claim 53 wherein said molecule is capable of hybridizing at 42°C in 20% formamide with the DNA sequence encoding the FSH receptor shown in figure 6a and 6b.
55. The vector of claim 54 wherein said molecule is the DNA sequence encoding the FSH receptor shown in figure 6a and 6b.
- 15 56. A host cell containing the vector of claim 54.
57. A host cell containing the vector of claim 55.
- 20 58. The host cell of claim 56 that is a eukaryotic cell.
59. The host cell of claim 56 that is a bacteria cell.